What is claimed is:

1. An apparatus for coherent combining type demodulation in a communication system using orthogonal modulation, the apparatus comprising:

means for generating a phase reference signal from signals received via multi-paths;

means for detecting phase error values of the signals received via the multi-paths using the phase reference signal, respectively; and

means for compensating the received signals via the multi-paths by applying the detected phase error values thereto, respectively.

2. The apparatus of claim 1, further comprising means for delaying the received signals while the phase error values detecting means detects the phase error values.

3. The apparatus of claim 1, the phase reference generating means comprising:

means for calculating symbol energy values of the orthogonal code correlation values by calculating orthogonal code correlation values of the received signals via the multi-paths, respectively; and

means for adding the symbol energy values of the correlation values per each orthogonal code for the entire multi-paths to determine the orthogonal code having a maximum energy value as the phase reference signal.

4. The apparatus of claim 1, the phase error values detecting means comprising:

means for selecting a value corresponding to the phase reference signal among the orthogonal code correlation values of the received signals via the multi-paths; and

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means for performing phase estimation filtering on the selected value.

5.   The apparatus of claim 4, wherein the phase estimation filtering means is an accumulator.

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6.   The apparatus of claim 1, wherein the phase errors compensating means compensates the phase errors by conjugate-complex-multiplying the received signals by the detected phase error values.

10   7.   The apparatus of claim 1, further comprising:

an adder adding the outputted in-phase components of the correlation values outputted from the phase errors compensating means; and

means for determining a symbol value of each value outputted from the adder.

15   8.   The apparatus of claim 1, wherein the orthogonal code is Walsh code.

9.   A receiver in communication system using orthogonal modulation, comprising:

an index detector for detecting Walsh index indicating maximum walsh code by calculating an energy of each Walsh code correlation value of signals received via multi-paths;

20   and

a plurality of fingers for receiving the Walsh index generated from the index detector and for compensating the signals received via the multi-paths, respectively.

10.   The receiver of claim 9, each of the fingers comprising:

a despreader for despreading I and Q-component signals received via the corresponding multi-paths;

first and second transformers for finding Walsh correlation values of the despread I and Q-component signals;

5   an energy detector for finding symbol energy values of the Walsh correlation values to output to the index detector;

a phase estimator for estimating phase error values of the Walsh correlation values by generating the Walsh correlation value corresponding to the Walsh index as a phase reference signal;

10   first and second delayers for delaying the despread I and Q-component signals until the corresponding phase error value is outputted from the phase estimator;

a phase rotator for compensating phase errors of the despread signals by applying the estimated phase error values to the despread signals delayed by the first and second delayers; and

a third transformer for finding the Walsh correlation values of the phase-compensated

15   despread I-component signals.

11.   The receiver of claim 10, the phase estimator compensates the corresponding phase error by conjugate-complex-multiplying the corresponding despread signal by the corresponding detected phase error value.

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12.   The receiver of claim 10, further comprising:

an adder adding output values of the third transformer to output; and

a decider determining a symbol value corresponding to the I-component Walsh correlation value outputted from the adder.

13. A receiver using a coherent combining technique in a communication system using orthogonal modulation, comprising:

a plurality of fingers for despreading received signals and outputting first outputs

5   corresponding to Walsh code energy values calculated by using correlation value of each walsh code and the despread signals and second outputs by compensating the correlation value by performing phase estimation filtering for the correlation value according to a control signal; and

a combiner for outputting the control signal indicating walsh code having maximum energy value of the first outputs to each fingers and symbol for a walsh code set by combining

10   the second outputs.

14. A coherent combining type demodulation method   in a mobile communication system, comprising the steps of:

generating a phase reference signal using signals received via multi-paths; and

15   compensating each of the signals received via the multi-paths using the phase reference signal to demodulate the corresponding received signal.

15.   The coherent combining type demodulation method of claim 14, wherein the phase reference signal generating step comprising the steps of:

20   finding correlation values for orthogonal codes and the received signals; and

adding energy of the correlation values for the orthogonal codes for the entire multi-paths per each of the orthogonal codes and selecting a maximum energy to generate as the phase reference signal.

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16. The coherent combining type demodulation method of claim 14, wherein the phase error compensating step comprising the steps of:

detecting phase error values of the received signals via the multi-paths, respectively using the phase reference signal;

5   compensating the received signals via the multi-paths by applying the detected phase error values thereto, respectively; and

combining the phase-error-compensated signals to demodulate the received signals.

17.   The coherent combining type demodulation method of claim 14, further

10   comprising the step of delaying the corresponding received signal while the corresponding phase error value is detected.

18.   The coherent combining type demodulation method of claim 17, wherein phase compensation of the delayed signal is accomplished by conjugate complex multiplication

15   between the received signal and the phase error value.

19.   The coherent combining type demodulation method of claim 17, the step of combining to demodulate the received signals, comprising the steps of:

adding in-phase components among the correlation values of the respective multi-paths

20   outputted from the phase error compensation step to output corresponding values; and

determining symbol values of the outputted corresponding values.

20.   The coherent combining type demodulation method of claim 14, wherein the orthogonal code is Walsh code.

21. A coherent combining type demodulation method using orthogonal modulation in a communication system, comprising the steps of:

receiving signals via multi-paths and dispreading the received signals for the corresponding multi-paths, respectively;

finding Walsh correlation values of the despread signals;

finding symbol energy values of the Walsh correlation values and detecting Walsh index having a maximum symbol energy among the symbol energy values;

estimating phase error values of the Walsh correlation values by generating the Walsh correlation value corresponding to the Walsh index as a phase reference signal;

delaying the despread signals until the corresponding phase error value is outputted;

compensating the despread signals by applying the estimated phase error values to the delayed despread signals, respectively; and

finding the Walsh correlation values of the phase-compensated despread signals.

22. The coherent combining type demodulation method of claim 21, further comprising the steps of:

adding to output I (in-phase) components of the Walsh correlation values of the phase-compensated despread signals; and

determining symbol values of the I (in-phase) components.